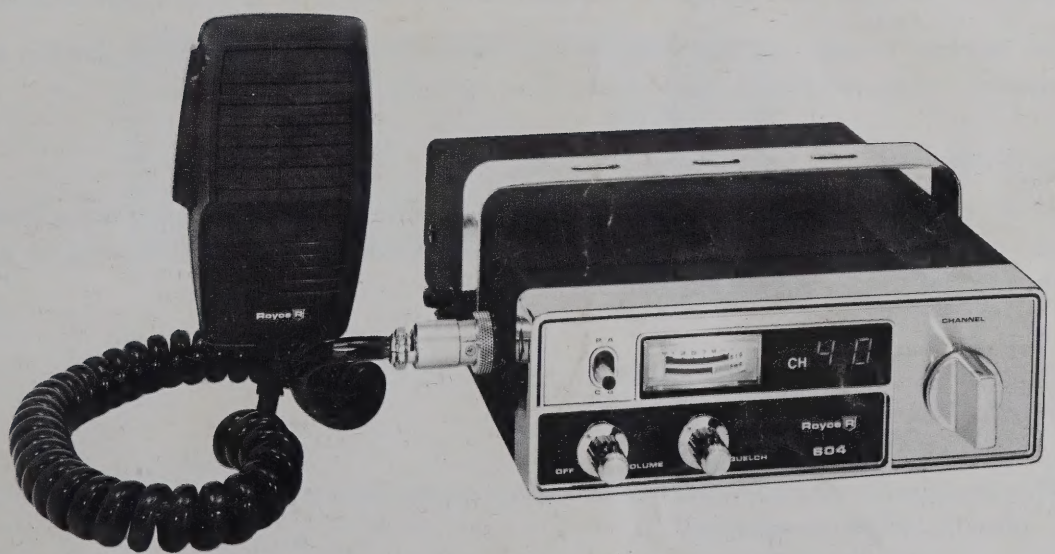
Royce
ELECTRONICS CORPORATION

Model 604

OWNER'S MANUAL

40 CHANNEL MOBILE CITIZENSBAND TRANSCEIVER WITH DIGITAL READOUT



GENERAL

Your new Royce 604 is a high quality 40 Channel AM Citizensband transceiver. It has many features and engineering design. Careful reading of the instruction manual before operation is essential for proper operation and prevention of damage.

PACKING

This unit has been especially protected for shipment. Open the carton carefully to avoid damage. Examine the unit for any visible damage. If the transceiver has been damaged in shipment, save the box the packing material and notify the transportation company.

DESCRIPTION

RECEIVER

A sensitive dual conversion superheterodyne circuit is employed with a tuned RF stage. This delivers top range performance.

Two ceramic filters provide a high degree of selectivity and rejection of unwanted adjacent channel interference.

Royce's automatic amplified A. G. C. circuit greatly improves the range of signal power the receiver can accept without distortion. It's fully electronic. Whether the station is extremely close or far away, you'll hear him. No need to push local-distant buttons or turn RF gain. It's fully automatic.

Additional receiver features include Royce's LSI (large scale integrated circuit) receiver section, variable squelch, integrated circuit audio stages, signal strength meter.

TRANSMITTER

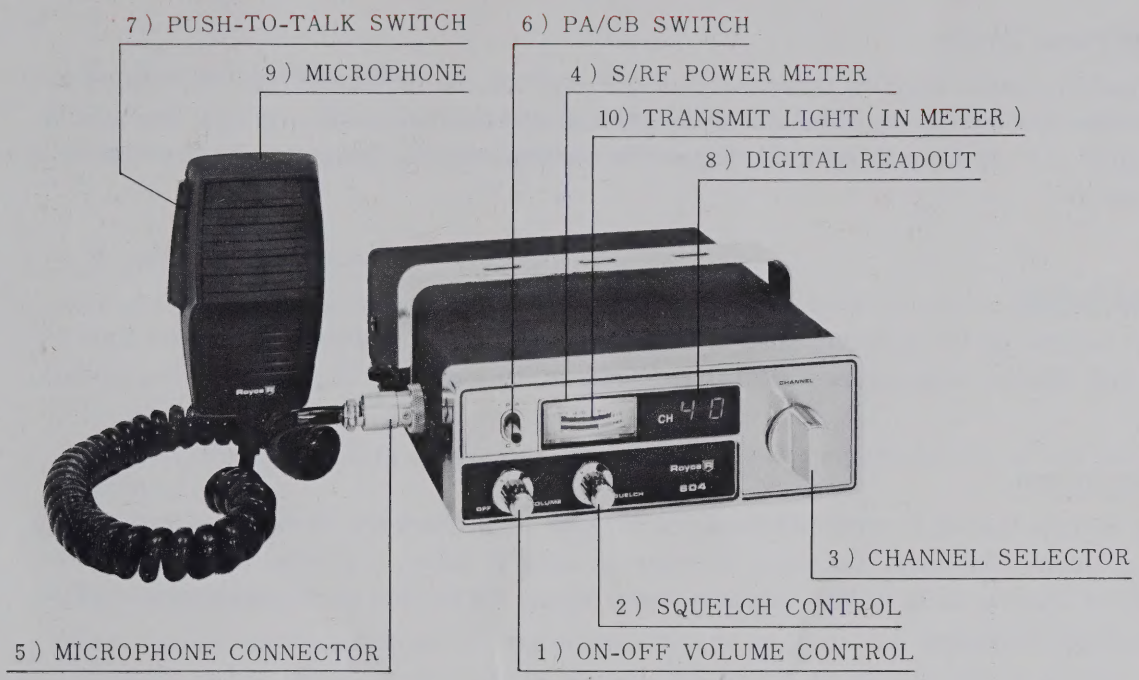
The heart of your 604 is the all new PLL oscillator. It provides full 40 channel operation from only two crystals. Integrated circuits plus other components replace the balance of crystals. PLL is the most accurate frequency system available for CB.

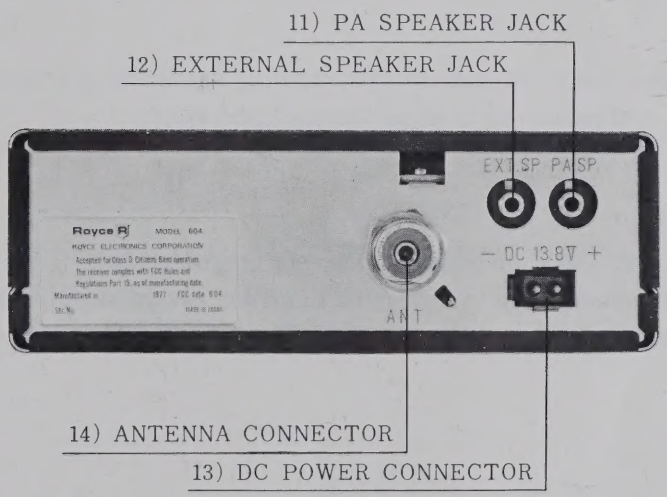
GENERAL

Your 604 is equipped with a powerful Public Address paging circuitry. It also is equipped to operate from 12 Volts DC positive or negative.

NOTE: The Model Number and Serial Number of your 604 are located on the metal plate riveted to the rear panel of the unit. Record and retain these numbers.

OPERATION OF CONTROLS





Front Panel

1. On-Off Volume Control
2. Squelch Control
3. Channel Selector
4. S/RF Power Meter
5. Microphone Connector
6. PA/CB Switch
7. Push-To-Talk Switch
8. Digital Readout
9. Microphone
10. Transmit Light (In Meter)

Rear Panel

11. PA Speaker Jack
12. External Speaker Jack
13. DC Power Connector
14. Antenna Connector

FEATURES AND CONTROLS

1. Volume/Power On-Off

This combination control supplies power to your 604 and adjusts the receiver volume. The switch should be turned clockwise from the "off" position. You will hear an audible "click". The L. E. D. channel display and meter will light. To adjust the volume continue advancing the control in a clockwise position.

2. Channel Selector

The channel selector switch is used to select the channel frequency. It automatically adjusts both the transmitter and receiver frequencies. Channels are displayed by large L. E. D. (light emitting diodes).

3. Squelch Control

The squelch control is used to eliminate background noise when there are no signals present strong enough to overcome the noise. To adjust the squelch control, select a channel where there is no signal. Turn the volume up to normal listening levels. Rotate the squelch control clockwise until the background noise disappears.

4. S/RF Meter

The 604 is equipped with a large, easy-to-read combination meter with a built-in transmit indicator light.

In the receive position, the meter reads the level of the incoming signals. In the transmit position, it indicates relative power output, and glows red to show transmit operation.

5. Automatic Noise Eliminator

Your 604 is equipped with a built-in automatic noise eliminator circuit. This greatly reduces extraneous noise coming into the receiver via the antenna. In effect, the noise pulses are clipped from the incoming signals before they reach the audio amplifier. This causes little or no loss in the signal receive level.

6. PA-CB Switch

A push-button switch converts your 604 into a powerful Public Address system. The "PA" function requires use of an optional 8-16 ohm paging speaker (Royce 2-060). This speaker must be connected to the "PA" jack on the back of the set. Once this speaker has been connected, simply put the PA-CB switch to the "PA" position. Depress the microphone push-to-talk switch to activate the circuit.

NOTE: THE VOLUME CONTROL ADJUSTS PA OUTPUT LEVEL

7. PA Speaker Jack

For attaching optional 8-16 ohm PA speaker, use 3.5mm jack.

8. External Speaker Jack

You may add any 8-16 ohm external speaker. Simply plug your accessory speaker into the jack. Inserting the 3.5mm plug will automatically disconnect the internal speaker.

9. Antenna Connector

A standard SO-239 type connector is supplied for attaching either mobile or base antennas.

10. DC Connector

This connector is used to supply power to your 604. The plug-in feature allows easy removal for switching vehicles.

11. Microphone

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. To transmit, simply press in this switch. Release the switch to receive. When transmitting, hold the microphone three to four inches from your mouth and speak clearly at normal voice levels.

SPECIFICATIONS

General

1.	Semiconductors	: 19 transistors, 1 FET, 19 diodes, 3 integrated circuits
2.	Self Contained Speaker	: 3 inch, 8 ohms voice coil.
3.	Microphone	: Dynamic microphone with push-to-talk switch, 500 ohms.
4.	Controls, Indicators and Connectors	: Volume control with power on-off switch. : Variable Squelch Control. : Channel Selector. : L.E.D. Channel Indicator. : Illuminated S/RF Power Meter : PA-CB. Slide Switch : Coaxial type antenna connector. : Microphone Connector. : DC Power Connector : External Speaker Jack. : Public Address Speaker Jack.
5.	Power Supply	: 13.8 Volts DC (positive or negative ground).
6.	Cabinet Description	: Plastic front with chrome plating
7.	Dimensions	: 7-5/16"(D) x 6-3/16"(W) x 2-1/8"(H)

Receiver

1.	Frequency Range (MHz)	: 26.965 ~ 27.405.
2.	Sensitivity	: 0.5μV for 10db S + N/N.
3.	Selectivity	: 5KHz minimum at 6db down.
4.	Adj. Channel Rejection	: More than 60db.
5.	Audio Power output at 8 ohms	: More than 2.5W at 10% distortion.
	at 4 ohms	: More than 4 W at 10% distortion.
6.	Audio fidelity (1KHz = 0db, 6db down)	: 400 Hz ~ 2,000Hz.
7.	A.G.C. figure of merit	: More than 80db.
8.	Squelch sensitivity (Threshold)	: Less than 0.5μV.
9.	Spurious Rejection	: More than 45db.

Transmitter

1.	Frequency Range (MHz)	: 26.965 ~ 27.405.
2.	RF Power Output	: 4 W
3.	Modulation Capability	: More than 80%
4.	Spurious Suppression	: More than 60db.
5.	Frequency Tolerance	: ±0.005%.

POWER SUPPLY

Almost all cars and most trucks currently operating in the U.S. are negative ground. There are some large trucks and construction equipment which do operate on positive ground. Your Royce 604 will operate on either. In the negative ground systems the minus (—) pole of the battery is attached to the car body, engine block, etc.

Negative Ground Hookup:

Attach the red (fused) wire to the fuse block terminal or any convenient plus (+) lead. Devices operated by the ignition key such as the radio, light, etc. are best since when you turn the ignition off, the unit will be turned off. Attach the black lead to the car body via any convenient method.

NOTE: Many newer cars use plastic dash pieces. Make sure the screw or contact you choose is attached to the metal framework of the car.

Positive Ground Hookup:

In the event that you do have a positive ground vehicle, the following hookup must be made. Attach the red (fused) lead to the car body via any convenient screw, bolt, etc. Attach the black lead to the terminal block or any convenient wire which goes to the minus (—) pole of the battery.

FAILURE TO MAKE THE PROPER CONNECTION COULD RESULT IN UNIT DAMAGE

ANTENNA REQUIREMENT

This transceiver will operate with any standard 52 ohm ground-plane, vertical, mobile whip, long wire or other CB antenna. A standard SO-239 type connector is provided on the back panel for use with popular PL-259 antenna plug.

Base Station:

When the 604 is used as a base station, any Citizens Band beam, dipole, ground-plane or vertical antenna may be used. A ground-plane type will provide greater coverage, and since it is essentially non-directional, it is ideal in base station to mobile operation. From base station to base station, or point-to-point operation, a directional beam will give greater distance even under adverse conditions. The range of the transceiver depends basically on the height of the antenna, and whenever possible, select the highest location within F. C. C. limits.

Antenna height limits are explained in Part 95 of the F. C. C. Rules and Regulations furnished you with this transceiver.

Mobile Antennas:

A vertical whip antenna is best suited for mobile use. A non-directional antenna must be used for best results in any case. The base loaded whip antenna will normally provide effective communication. For greater range and more reliable operation, a full quarter wavewhip should be used. Either of these antennas use the metal car body as a ground-plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

MOBILE INSTALLATION

A location in the car or truck should be chosen carefully for convenience of operation and non-interference with normal driving functions. Mounting may be under the dash or instrument panel or any place a secure installation can be made. The carrying handle again serves as the mounting bracket or additional perforated straps or brackets may be used as desired. The 12 Volt cable may be connected to any convenient terminal but preferably to the ignition switch to prevent unauthorized persons from operation of your unit. With this method the unit will only operate when your key is turned on. Engine ignition interference should not be a problem and vehicles equipped with standard broadcast radios will have enough suppression to eliminate ignition interference. If interference is present, any skilled auto radio repairman should be able to eliminate it for you.

BASE STATION INSTALLATION

For base station use the Royce Model 2-050 power supply is recommended. When this power supply is used, simply connect the red (+) and black (—) terminals on the power supply to the (+) and (—) leads on your604. Do not attempt to operate this transceiver by connecting directly to 110 Volts AC.

GENERAL OPERATING PROCEDURE

CAUTION: BEFORE OPERATING THIS TRANSCEIVER, YOU ARE REQUIRED BY LAW TO READ AND UNDERSTAND PART 95 OF THE FCC RULES AND REGULATIONS.

CHECK TO SEE IF THE PROPER CONNECTIONS HAVE BEEN MADE ON THE POWER CABLE, ANTENNA SYSTEM, AND MICROPHONE.

Receiver

a. Put PA-CB switch to the CB position.
b. Plug in microphone.
c. Set Channel Selector to the desired channel.
d. Turn the volume and squelch controls fully counter clockwise.

e. Rotate the volume control clockwise. You will hear an audible "click" and the meter and channel dial lights will come on. Continue rotating clockwise to desired listening level.

f. With no signal present, rotate the squelch control clockwise until the rushing noise disappears.

TRANSMITTER

WARNING: IT IS ILLEGAL TO OPERATE THE TRANSMITTER SECTION OF THIS TRANSCEIVER PRIOR TO RECEIVING A VALID STATION LICENSE AND CALL SIGN FROM THE FEDERAL COMMUNICATIONS COMMISSION.

CAUTION: NEVER OPERATE THIS UNIT WITHOUT AN ADEQUATE ANTENNA SYSTEM OR LOAD. ANTENNA SWR SHOULD NOT EXCEED 3:1. FAILURE TO FOLLOW THESE RECOMMENDATIONS COULD RESULT IN DAMAGE TO THE RF OUTPUT TRANSISTOR.

To transmit, depress the Push-To-Talk switch on the microphone.
Hold the microphone 3 to 5 inches from your mouth and talk in a normal level.

PUBLIC ADDRESS

Attach an optional paging speaker (Royce Model 2-060 or equivalent) to the P.A. jack on the back of the unit.

Put the PA-CB switch to the "PA" position. To activate circuit, simply depress the Push-To-Talk switch on the microphone.

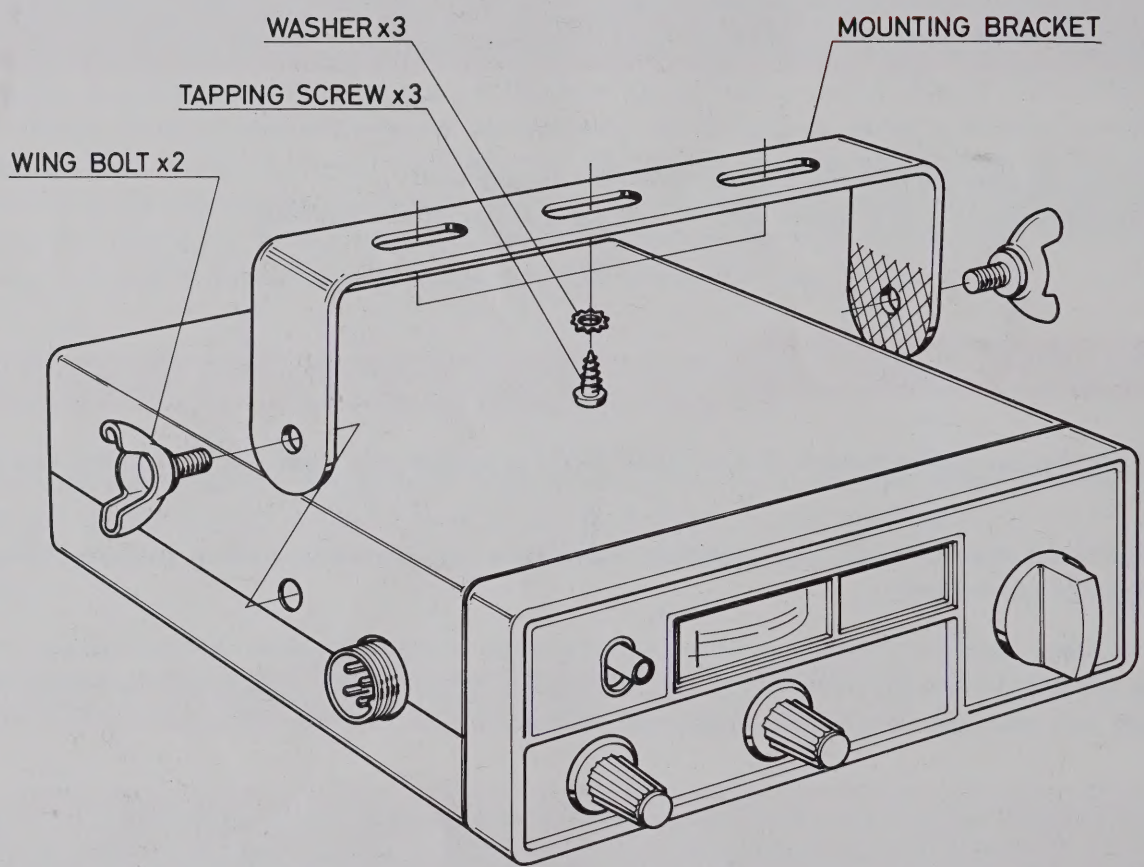
In some cases, feedback may occur if there is not enough separation between the microphone and paging speaker. Orient microphone so it is 180 degrees from speaker. If this does not solve the problem, you may have to move the speaker farther away.

SERVICING YOUR TRANSCEIVER

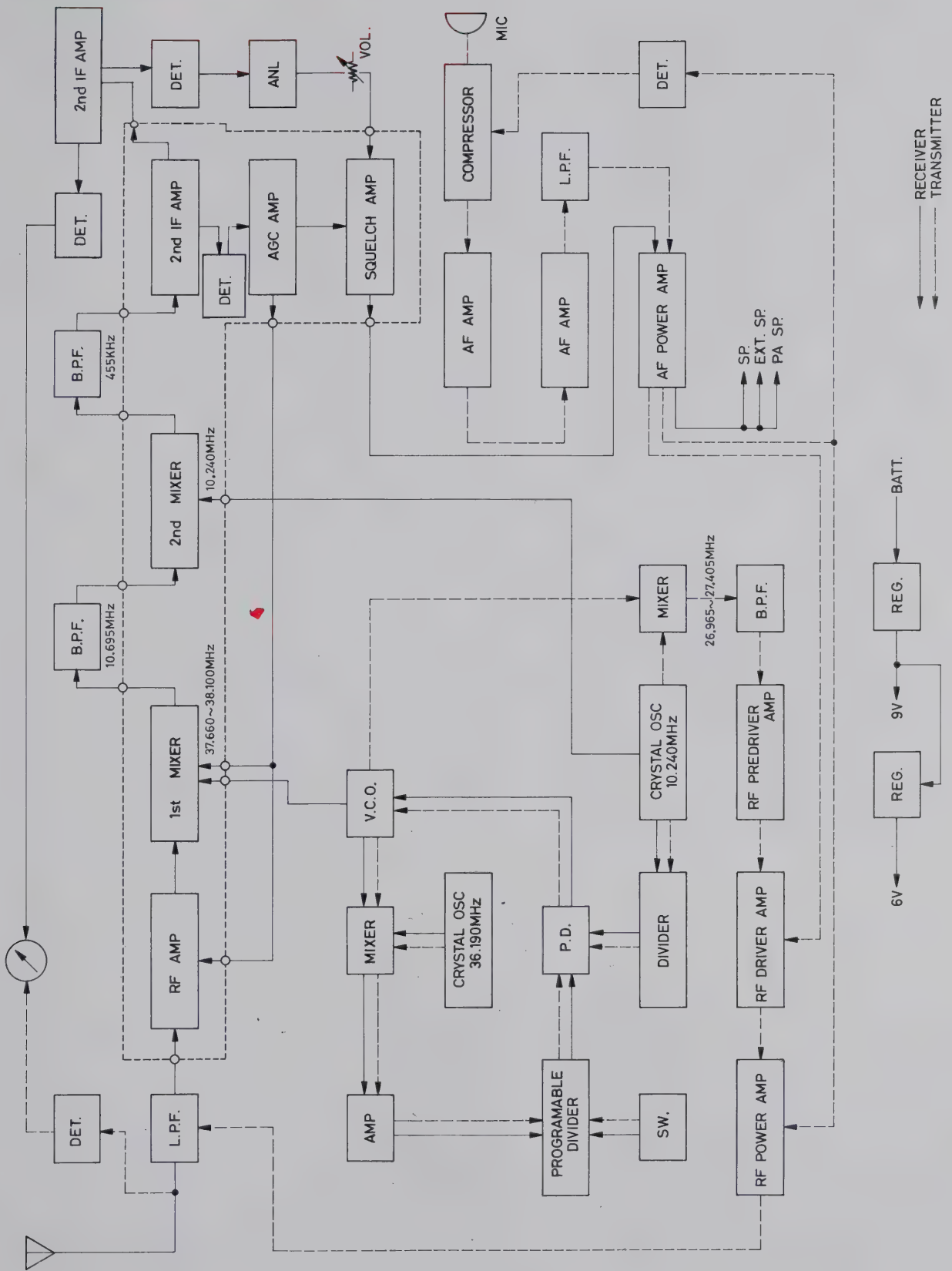
The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F. C. C. citizens radio service regulations.

If you install your own transceiver, do not attempt to make any transmitter tuning. Adjustments are prohibited by the F. C. C. unless you hold or are in the presence and under the supervision of a first or second class radiotelephone licensed person. A Citizens Band or Amateur license is not sufficient.

MOUNTING INSTRUCTIONS

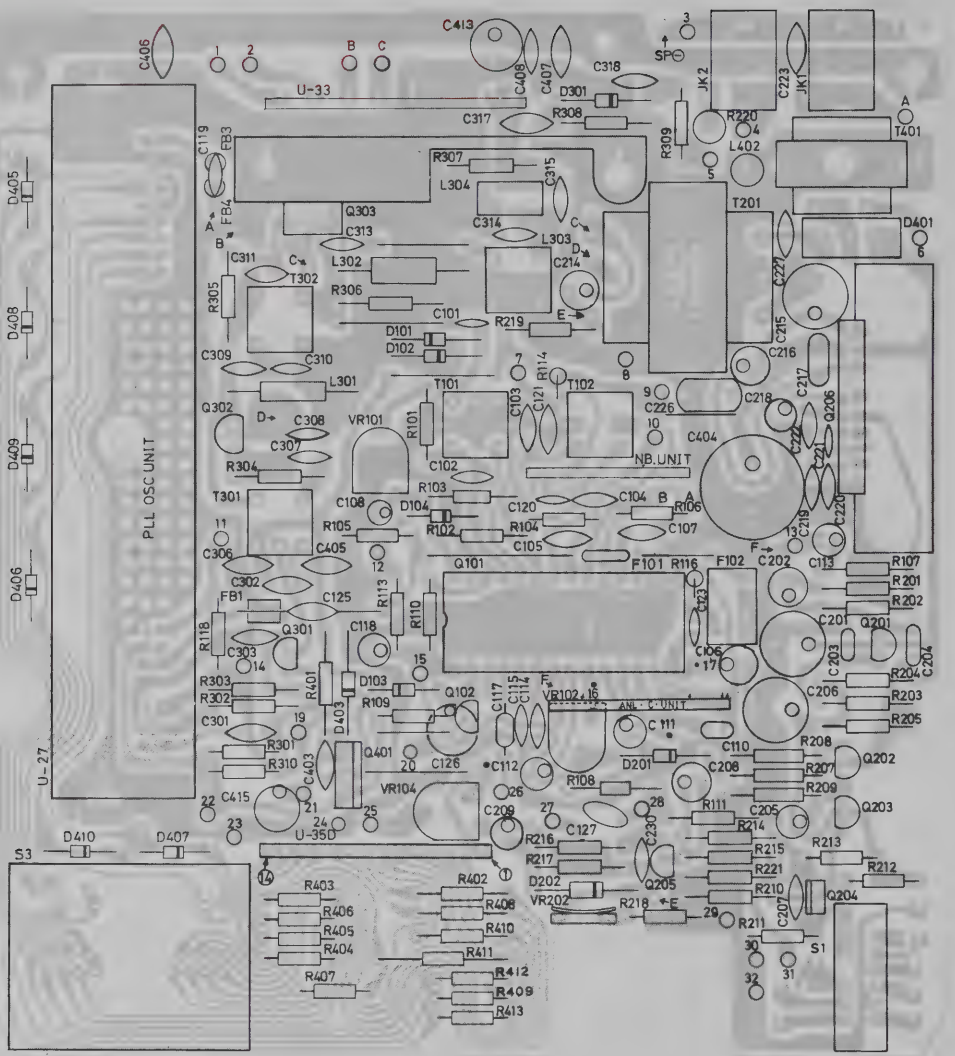


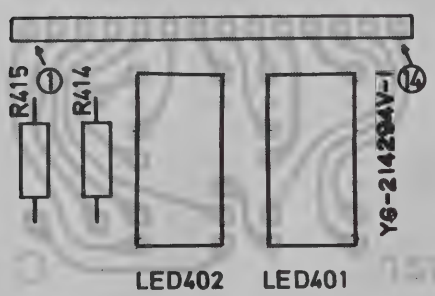
BLOCK DIAGRAM



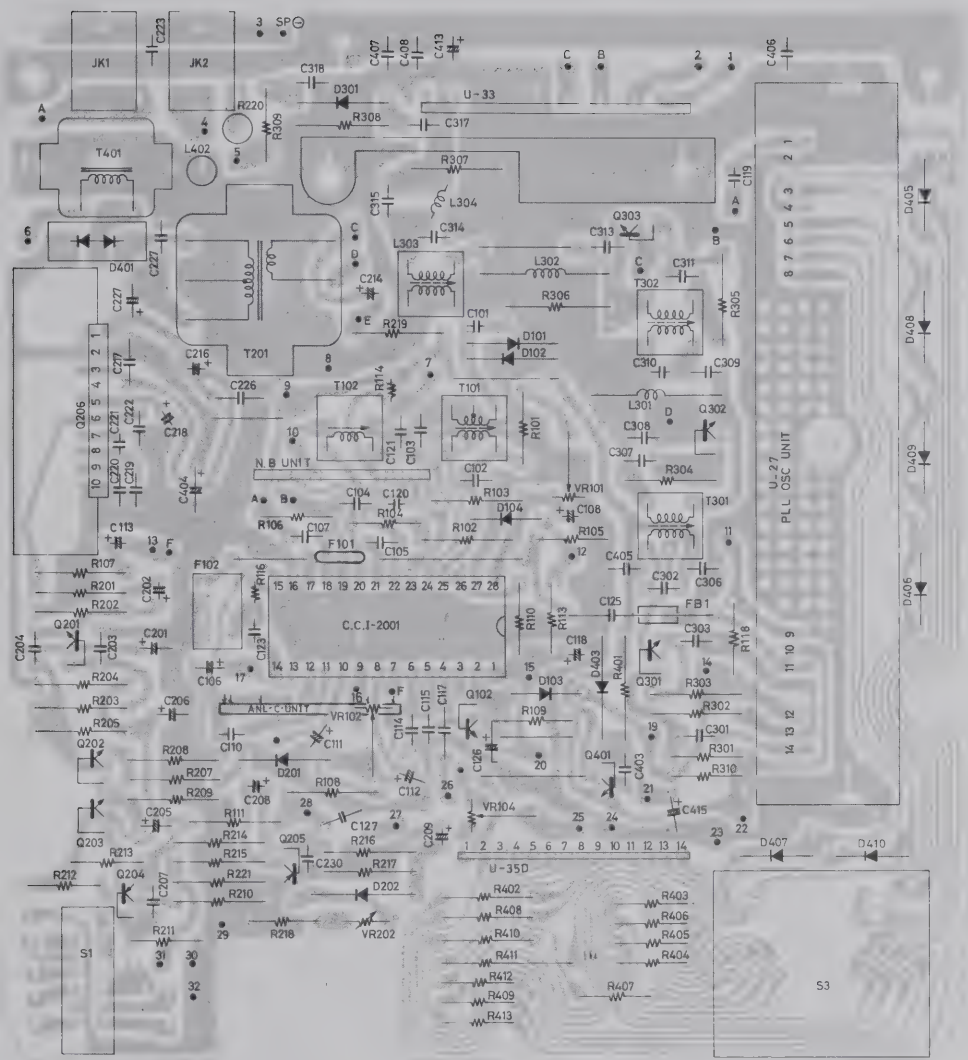
PARTS LAYOUT

TOP VIEW





BACK VIEW


JK1
JK2
T401
T201
T102
T101
T302
T301
L402
L304
L303
L302
L301
Q303
Q302
Q201
Q202
Q203
Q204
Q205
Q206
Q102
Q401
D401
D101
D102
D103
D104
D201
D202
D301
D403
D405
D406
D407
D408
D409
D410
F101
F102
FB1
C.C.I-2001
N.B UNIT
ANL-C-UNIT
PLL OSC UNIT
U-27
U-33
U-35D
S1
S3
VR101
VR102
VR104
VR202
R220
R309
R308
R307
R306
R305
R304
R303
R302
R301
R310
R219
R114
R101
R103
R104
R106
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C125
C118
C303
C306
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C405
C301
C403
C401
C415
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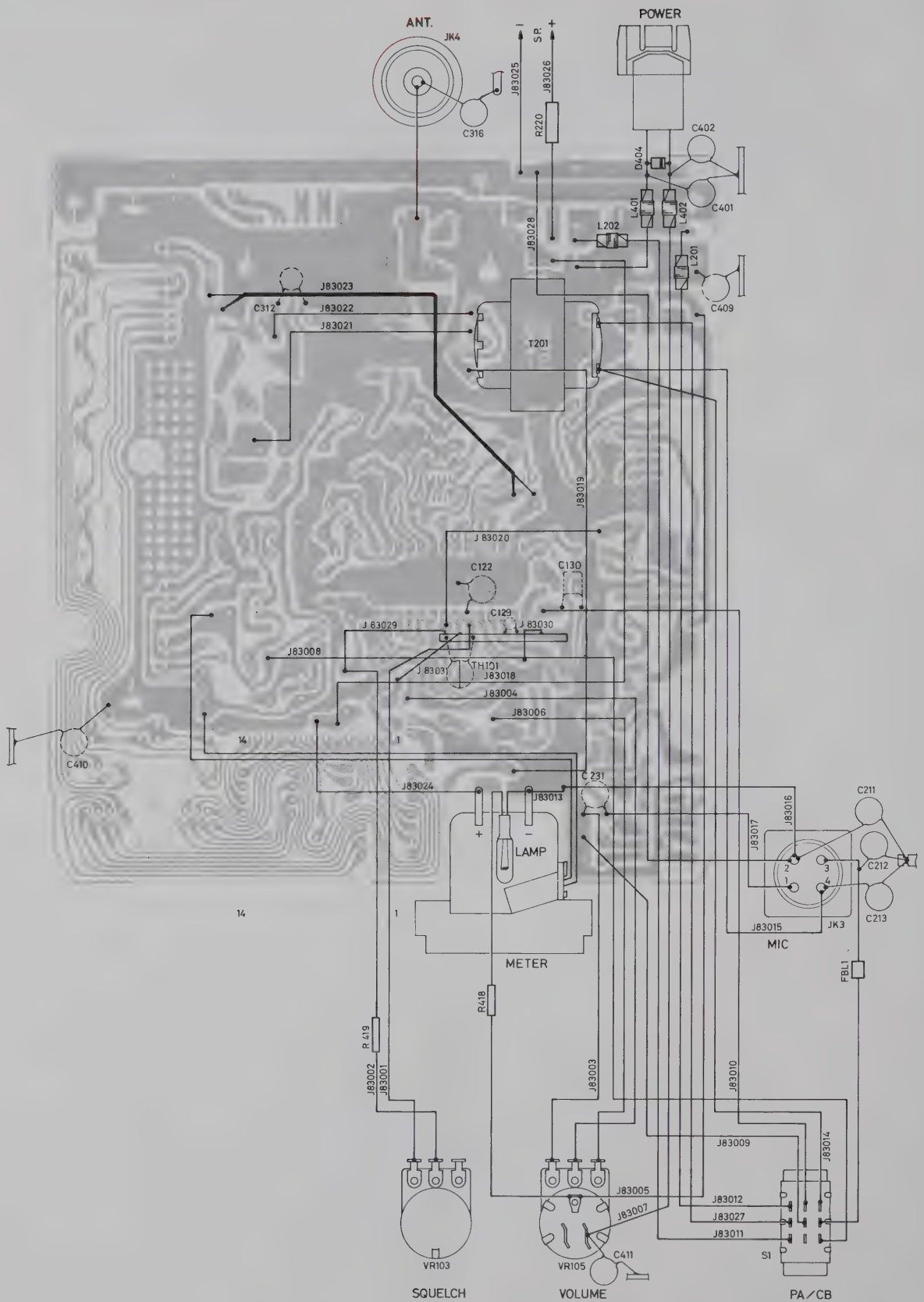
C408
C413
C406
C119
C101
LED402
LED401
R415
R414
1
14

WIRING DIAGRAM



VOLTAGE CHART

Q101 CCI 2001			
PIN NO	Tx	Rx	
1	0.3	6.4	
2	0.8	7.1	
3	0	0	
4	0.3	0.8	
5	0.3	3.6	
6	0	2.4	
7	0	1.7	
8	0	0	NO SQUELCH
	0.3	1.0	SQUELCH
9	0	6.4	NO SQUELCH
	0	2.9	SQUELCH
10	0	3.1	
11	0.3	2.9	
12	0	3.0	
13	0	3.5	
14	0	0.7	
15	0	0	
16	0	0	
17	0	3.5	
18	0	0.7	
19	0	0	

Q101 CCI 2001			
	Tx	Rx	
20	0	4.5	
21	0	0.6	
22	0	4.2	
23	0	0	
24	0.2	0.7	
25	0.1	0.7	
26	0.3	1.8	
27	0	0	
28	0	5.6	

Q206 M51513L			
PIN NO	Tx	Rx	
1	6.4	6.5	
2	12.4	12.7	
3	10.6	10.9	
4	3.8	3.9	
5	3.0	3.0	
6	3.1	3.2	
7	1.9	1.9	
8	7.6	7.7	
9	1.3	1.3	
10	0	0	

		Vb(V)		Vc(V)		Ve(V)	
		Tx	Rx	Tx	Rx	Tx	Rx
Q102	2SD467	0.8	7.1	9.0	9.0	0.3	6.5
Q201	2SC458	3.9	10.6	12.6	12.7	3.3	10.4
Q202	2SC458	1.9	2.6	3.9	10.9	1.3	3.7
Q203	2SC458	2.5	3.2	9.0	10.9	2.0	2.6
Q204	2SA844	5.7	6.9	2.5	3.1	6.3	7.6
Q205	2SB561	0	0	0	0	0	0
Q301	2SC1908	2.9	3.3	12.7	12.7	2.2	8.9
Q302	2SC2086	0.2	0	12.3	13.4	0	0
Q303	2SC2166	0.2	0	12.3	13.4	0.1	0
Q401	2SC1173	9.6	9.5	12.6	12.8	8.9	8.9
Q601	2SC458	0	2.0	0	6.6	0	1.65

ALIGNMENT INSTRUCTION

RECEIVER

A. Inject at the ant. jack a 27.185MHz signal (±.001%; 30% modulation at 1KHz).
B. Connect an audio voltmeter and oscilloscope across on 8 ohm load and plug into external speaker jack.

Test Equipment	Test Point	Adjust	Remarks
1. RF signal generator (low range to avoid audio saturation)	Inject at ant. jack	Channel set to 19	———
		T-101, T-102, VR-101,	Max. output with vol. control at max, squelch control at min. output should be more than 500mw (2.0v/8 ohm) with gen. voltage at 1μV; S + N/N more than 10dB on all channels
RF signal generator	Inject at ant. jack	VR-104	Set the ant. input to 100μv and the meter indication to 9 by VR104
RF signal generator	Inject at ant. jack	VR-102	Set the volume control and the squelch control at maximum, and set the tight squelch by VR102 so that the output from speaker is heard when the ant. input is increased up to 1,000μv,

AGC RESPONSE

Set the output voltage of a signal generator at 50000μV and adjust the volume control so that the voltmeter output is 500mW (2.0v/8 ohm). Then, lower the output voltage of the generator so that the voltmeter output is 10dB down. The output voltage of the signal generator should be under 5μV at this time.

AUDIO POWER CHECK

With a generator output of 1mV and squelch control at minimum, audio output should be more than 3.5w (5.7v/8 ohm) at maximum position of volume control.

TRANSMITTER

A. Power Supply — 13.8VDC.
B. Use a suitable power meter, non-inductive dummy load and oscilloscope connected to antenna jack.

Test Equipment	Test Point	Adjust	Remarks
1. Power Meter	Antenna jack	T-301, T-302, L-303,	Adjust for maximum output power
2. Freq. Counter	Across dummy load	———	Check all channels ± 800Hz
3. A.F. Oscillator with AF voltmeter in shunt (1KHz 30mV)	Inject at mic input	VR-202	— 90% modulation oscilloscope
		———	Reduce AF oscillator output to 5mV; modulation ≧ 50%

YOU AND YOUR ANTENNA

Three main components comprise a typical Citizensband installation. They are: your transceiver, an antenna, and the coaxial cable which connects the antenna to the transceiver. It is important that all three pieces are installed correctly to give the best possible range and reliable performance. We hope this information will be helpful for you to realize the maximum performance of your installation.

ANTENNA

For several reasons, it is impossible to exactly PRE-TUNE an antenna at the factory. A general range of tuning is done which may suffice, but for best performance, an antenna should be tuned after it is installed.

Most antennas have some form of tuning capability. Usually, this involves the whip section sliding into a coil, spring, or metal section. This allows the antenna to be adjusted to the exact frequency desired. All Royce antennas are the "broad band" type. When adjusted for Channel 20, they will perform well from Channels 1-40. An untuned antenna robs you of range and could cause, after a period of time, substantial deterioration of the performance of an RF output transistor. We cannot stress enough the importance of tuning your antenna. The measure of an antenna's performance is its "SWR" (standing wave ratio).

"COAXIAL" CABLE

Coaxial cable is used in all Citizensband installations. This cable transfers the power from your transceiver to the antenna. The output of your transceiver is 50-52 ohms. Your antenna is designed to be 50-52 ohms. For this reason, RG58/U or RG8/U cable is used because it also is 52 ohms and matches the antenna to the unit. The frequency of the antenna is very important in this area because a mis-tuned antenna can disrupt the system balance. If this balance is disrupted, standing waves are generated on the coaxial cable, which results in a loss of power in your transceiver.

UNDERSTANDING SWR (Standing Wave Ratio)

In theory, your transceiver has a 50 ohm output and your antenna is 50 ohms. If a 50 ohm cable (such as RG58/U or RG8/U) is used, all the power from your transceiver will be transmitted via the coaxial cable and radiated by the antenna. Under these conditions, the SWR (standing wave ratio) of your antenna system would be 1:1. In practice, the antenna must be 50 ohms and tuned to the exact channel. This condition seldom exists and standing waves are set up on the cable. This SWR robs you of power and likewise range. While 1:1 is not always possible to attain, you should tune your antenna system so the SWR does not exceed 1.5 to 1 or at maximum 2 to 1. Here are some examples of the power losses for various SWR ratios:

SWR		Power Losses
1:1	=	0
1.3:1	=	2%
1.5:1	=	3%
1.7:1	=	6%
2:1	=	11%
3:1	=	25%
4:1	=	38%
5:1	=	48%
6:1	=	55%
10:1	=	70%

TUNING YOUR ANTENNA

For optimum performance, an SWR meter should be used to tune the antenna. However, since this meter may cost from $15.00 to $30.00, not everyone may want to invest in its purchase. If possible, borrow one. If you are unable to borrow one, the RF output meter on your transceiver can be used as a GUIDE to antenna tuning. While it is not 100% accurate, it is generally better than no tuning at all. Always tune your antenna in an open area. Wires, metal and copper tubing if nearby can effect the tuning. Never tune an antenna inside a garage, under a metal car port, next to a metal truck, etc.

A. USING YOUR TRANSCEIVER OUTPUT METER AS A TUNING GUIDE

After installing your antenna system, place the whip halfway into its receptacle and turn your transceiver to Channel 20. Depress the switch on your transceiver microphone, and make note of the reading on your RF output meter. Loosen the adjustable whip section and move it 1/8 to 1/4 inch down. Again depress the transmit switch, if the reading is the same or lower continue moving the whip down 1/4 inch at a time until the LOWEST reading is obtained on your transceiver RF meter. If the reading was higher, move the whip up 1/4 to 1/2 inch the first time and 1/8 to 1/4 inch thereafter until the LOWEST reading is obtained on the RF meter. That's right....

THE LOWEST READING. Your RF output meter is a voltage sensing device. It is installed in the RF output circuit and senses the voltage near the antenna terminal. In a perfectly tuned system all of the voltage is transferred from the output transistor and passed to the antenna. As an example, let's use the figure 10. If there is SWR on the line, the forward voltage is 10 and a reverse voltage appears (let's say it's 2). The meter circuit now sees 20 and shows a higher reading. You can see that because of the way most RF output meters work, the LOWER your RF output meter reads the better your antenna is tuned. Of course, if the meter reads less than 1/2 scale, it may indicate a problem in your set and should be checked. Similarly, an extremely high reading may indicate a problem in your antenna. An RF output meter can tell you much. . .especially if you know how to use it.

B. TUNING YOUR ANTENNA WITH AN SWR METER

Using an SWR meter is the most accurate way to tune an antenna.

Connect the SWR meter as close as possible to the back of the transceiver. Use a double male connector or a very short piece of RG58/U with connectors on each end.

Place the adjustable whip halfway into its receptacle. Set your transceiver to Channel 20. Measure the SWR following instructions supplied with the meter. After the first measurement, move the whip down 1/8 to 1/4 inch and repeat ALL the steps again. If the SWR is lower, continue the process moving the whip down 1/8 to 1/4 inch at a time until the lowest reading is obtained. If the SWR is higher, raise the whip 1/4 to 1/2 inch the first time and 1/8 to 1/4 inch thereafter until the lowest SWR is obtained. Note, if the reading continues falling but you have reached farthest point down that you can go with the whip, the whip may be too long. To verify this, put the Channel Dial to Channel 1 and measure the SWR. Next, put the channel dial to Channel 40 and measure the SWR. IF THE SWR WAS LOWEST ON CHANNEL 1 AND HIGHEST ON 40 THE WHIP SECTION IS TOO LONG. Carefully cut 1/4 to 3/8 inch from the whip section and re-measure Channels 1, 20, and 40. If the SWR is still lowest on Channel 1 continue trimming the whip by removing 1/8 to 1/4 inch at a time until the lowest SWR is obtained on Channel 20. DO NOT GET OVERANXIOUS. YOU CANNOT REPLACE A SECTION ONCE IT IS CUT OFF. If you exceed slightly the best tuning for Channel 20, the whip may be raised 1/8 to 1/4 inch at a time to obtain the best SWR on Channel 20.

WARNING: DO NOT CUT THE WHIP USING THE "POWER OUTPUT METER TUNING METHOD" YOU MUST USE AN SWR METER TO ACCURATELY DETERMINE THE SWR.

Every six months or so, re-check the SWR. Car washes, road grime, and chemicals can effect the mechanical connections of an antenna and corrode them. This corrosion can cause poor electrical connections and lead to high SWR. The correction of this problem is usually accomplished by cleaning of the metal connection parts with a wire brush.

HELPFUL HINTS

1. High SWR robs you of range and puts a strain on your output transistor. ALWAYS TUNE A NEW ANTENNA.
2. Never tune your antenna in a closed area (garage, under a metal car port, etc.) incorrect tuning may result.
3. MAKE SURE ALL MECHANICAL CONNECTIONS ARE TIGHT.
4. DON'T SMASH OR SHARPLY BEND THE COAX CABLE – it should remain generally round to do its job properly.
5. TIGHTEN YOUR PL-259 CONNECTOR OCCASIONALLY – road vibration has a tendency to loosen it which can cause output transistor problems.
6. PERIODICALLY (every 6 months) re-check your SWR. Corrosion and road grime may rob you of performance.
7. PERIODICALLY check your coaxial cable for wear. A broken or loose wire could cause RF output transistor failure.

This information was produced to help you understand the installation and maintenance of your antenna and cable feed system. Many field problems have been traced to problems such as the above. They can lead to eventual failure of the RF output transistor in your transceiver. Careful installation and maintenance can prevent these problems.

TECHNICAL INFORMATION

FEDERAL COMMUNICATIONS COMMISSION REQUIREMENTS

The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F. C. C. citizens radio service regulations.

If you install your own transceiver, do not attempt to make any transmitter tuning. Adjustments are prohibited by the F. C. C. unless you hold or are in the presence and under the supervision of a first or second class radiotelephone licensed person. A Citizens Band or Amateur license is not sufficient.

LIMITED WARRANTY

We warrant each new Royce product to the original consumer purchaser to be free from defects in material and workmanship for a period of ninety (90) days from date of purchase as shown on purchaser's receipt.

Royce will repair or replace, AT ITS OPTION AND FREE OF CHARGE, during the warranty period, any part which proves defective in material and/or workmanship under normal installation, use, and service. To obtain the name and address of a warranty service center in your area, just contact your local dealer listed in the telephone directory or return the unit to our factory, TRANSPORTATION CHARGES PREPAID, at the address below. THIS WARRANTY IS LIMITED TO DEFECTIVE PARTS REPAIR AND/OR REPLACEMENT ONLY AND DOES NOT COVER ANY ACCESSORY USED IN CONNECTION WITH THIS PRODUCT. LABOR CHARGES AND/OR DAMAGE INCURRED IN INSTALLATION, REPAIR, OR REPLACEMENT AS WELL AS INCIDENTAL AND CONSEQUENTIAL DAMAGES CONNECTED THEREWITH ARE EXCLUDED.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Any damage to this product as a result of misuse, abuse, neglect, accident, incorrect wiring (not our own), improper installation, repair or alteration outside our factory or authorized service centers, or any use violative of instructions furnished by us, WILL VOID THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, a state court, or a federal district court.

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816-842-7505

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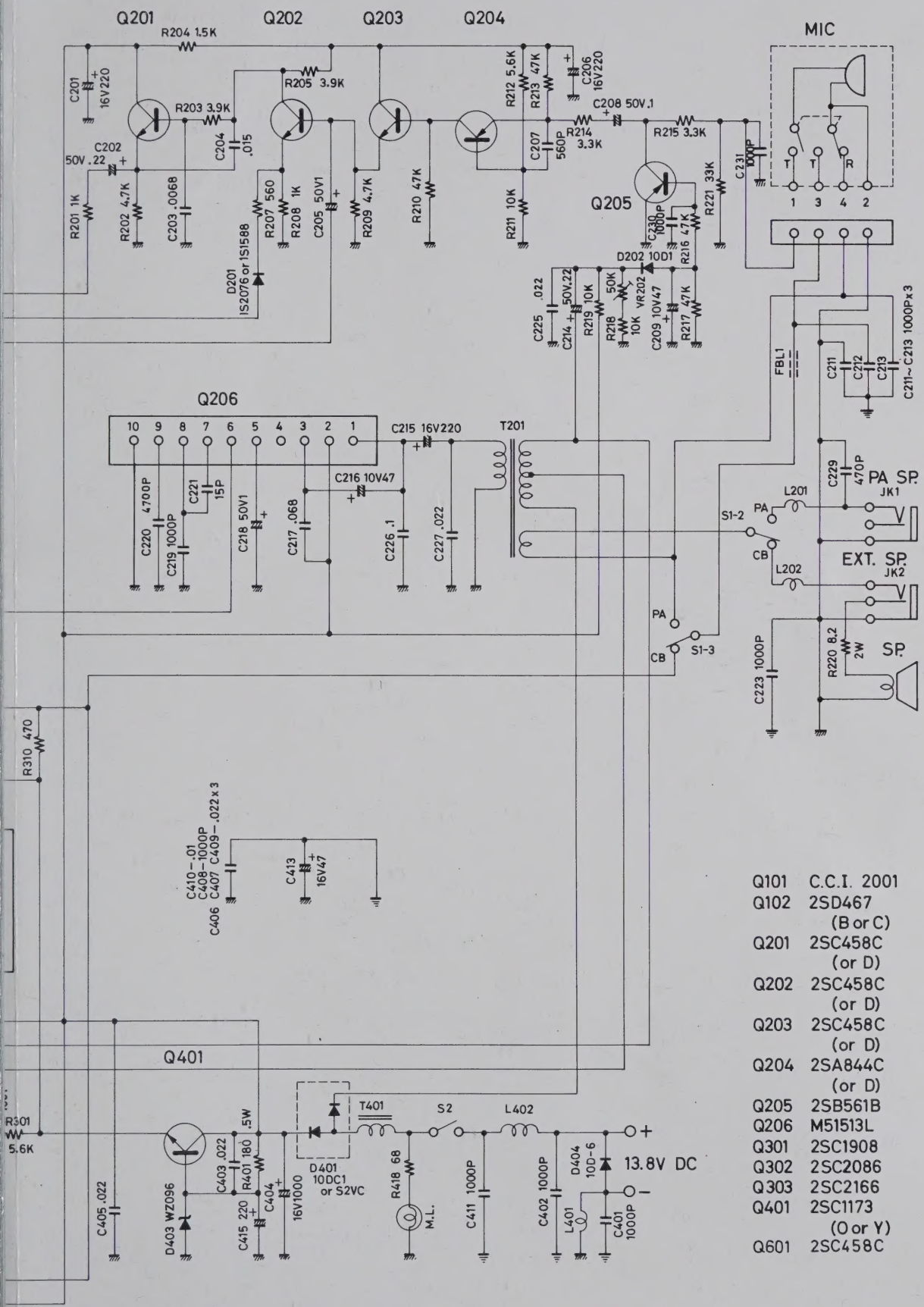

Q101	C.C.I. 2001
Q102	2SD467 (B or C)
Q201	2SC458C (or D)
Q202	2SC458C (or D)
Q203	2SC458C (or D)
Q204	2SA844C (or D)
Q205	2SB561B
Q206	M51513L
Q301	2SC1908
Q302	2SC2086
Q303	2SC2166
Q401	2SC1173 (O or Y)
Q601	2SC458C

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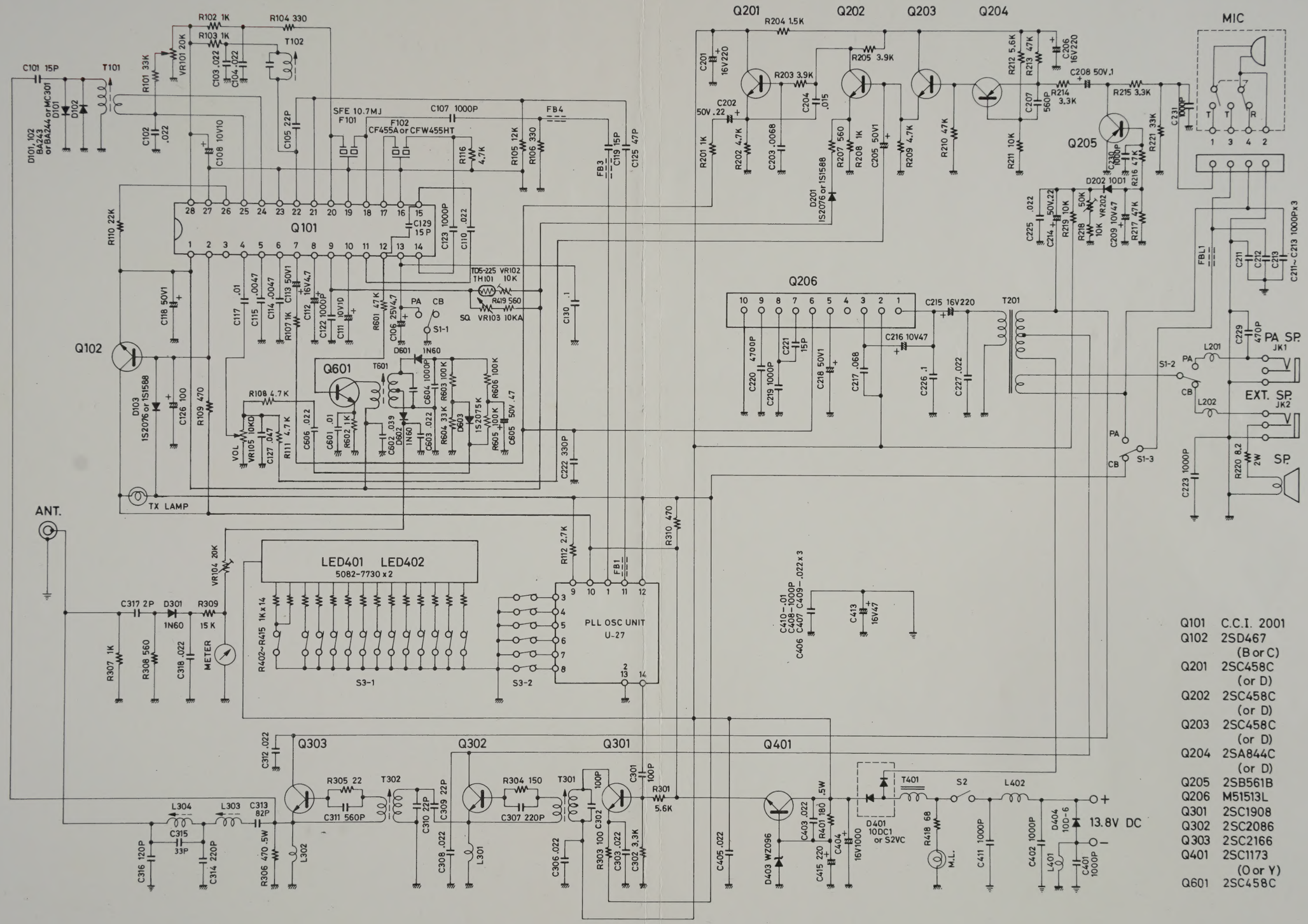
SCHEMATIC DIAGRAM



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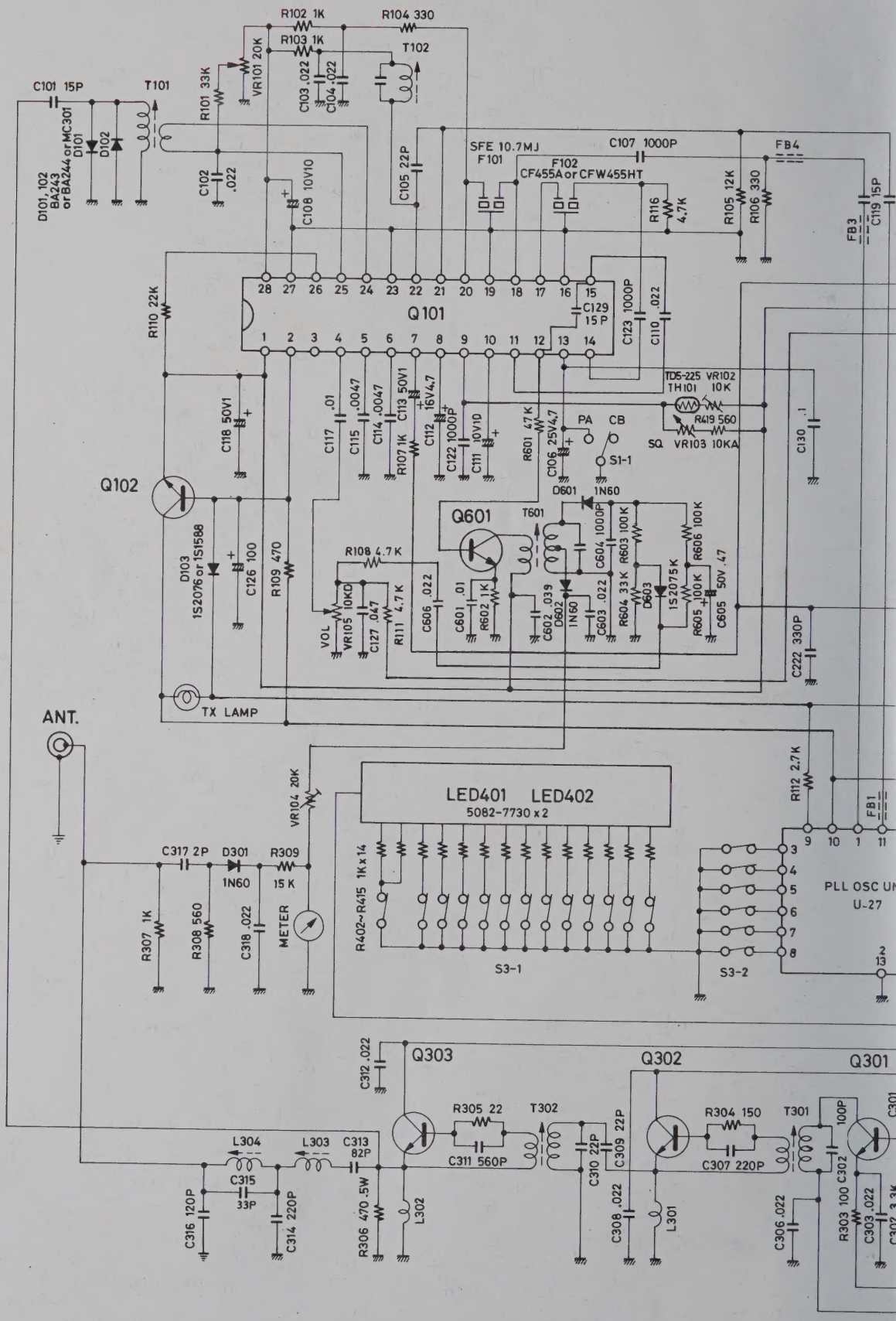

Ser. 2